

IN THE CLAIMS:

1. An OLED device structure comprising:

a substrate;

an OLED display area comprising one or more active pixels disposed over said substrate, each of said one or more active pixels comprising an anode region, a cathode region and a light-emitting region;

a cover over said OLED display area, wherein said cover permits transmission of light from said one or more active pixels to an outer environment, and wherein said cover and said substrate cooperate to restrict transmission of oxygen and water vapor from said outer environment to said OLED display area; and

a patterned getter layer disposed between said substrate and said cover, said patterned getter layer being configured so as to substantially avoid obstructing said transmission of light from said one or more pixels.

2. The OLED device structure of claim 1, wherein said patterned getter layer is provided on said substrate.

3. The OLED device structure of claim 1, wherein said patterned getter layer is provided on said cover.

4. The OLED device structure of claim 1, wherein said patterned getter layer is provided at a position that is laterally beyond said OLED display area.

5. The OLED device structure of claim 4, wherein said patterned getter layer is provided in the form of a ring that laterally surrounds said OLED display area.

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6. The OLED device structure of claim 1, wherein said OLED display area comprises a plurality of said active pixels, and wherein at least a portion of said patterned getter layer is provided over non-emitting regions of said OLED display area between at least some of said plurality of pixels.
7. The OLED device structure of claim 1, wherein said patterned getter layer comprises at least one material selected from Group IIA metals and Group IIA metal oxides.
8. The OLED device structure of claim 1, wherein said patterned getter layer comprises at least one material selected from calcium metal, barium metal, calcium oxide and barium oxide.
9. The OLED device structure of claim 1, wherein portions of said patterned getter layer are sufficiently narrow to prevent said patterned getter layer from cracking when said OLED device structure is flexed during normal service.
10. The OLED device structure of claim 9, wherein said patterned getter layer comprises a plurality of narrow bands of getter material.
11. The OLED device structure of claim 9, wherein said patterned getter layer comprises a plurality of small dots of getter material.
12. The OLED device structure of claim 1, wherein said light emitting region comprises a hole transporting layer, an emission layer and an electron transporting layer.
13. The OLED device structure of claim 1, wherein said substrate, said anode region and said cathode region each permits transmission of light between said light-emitting region and said outer environment.

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14. The OLED device structure of claim 1, wherein said substrate is opaque, wherein said anode region is disposed under said light-emitting region, and wherein said cathode is disposed over said light-emitting region and permits transmission of light between said light-emitting region and said outer environment.

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15. The OLED device structure of claim 1, wherein said substrate is opaque, wherein said cathode region is disposed under said light-emitting region, wherein said anode is disposed over said light-emitting region and permits transmission of light between said light-emitting region and said outer environment.

16. The OLED device structure of claim 1, further comprising a sealing region disposed between said substrate and said cover, said sealing region cooperating with said substrate and said cover to enclose said OLED display area and restrict transmission of water and oxygen from an outer environment to said OLED display area.

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17. A method of making an OLED device structure comprising:

- providing a substrate;
- forming an OLED display area over said substrate, said OLED display area comprising one or more active pixels, each of said one or more active pixels comprising an anode region, a cathode region and a light-emitting region;
- providing a cover over said OLED display area, wherein said cover permits transmission of light from said one or more active pixels to an outer environment, and wherein said cover and said substrate cooperate to restrict transmission of oxygen and water vapor from said outer environment to said OLED display area;
- and
- providing a patterned getter layer between said substrate and said cover, said patterned getter layer being configured so as to substantially avoid obstructing said transmission of light from said one or more pixels.

18. The method of claim 17, wherein said patterned getter layer comprises a metal, and wherein said patterned getter layer is provided by vacuum deposition through a masking layer.

19. The method of claim 17, wherein said patterned getter layer comprises a metal oxide, and wherein said patterned getter layer is provided by applying a getter material in the form of a paste.

20. The method of claim 19, wherein said paste is applied by a technique selected from screen-printing and extrusion.

21. An organic optoelectronic device structure comprising :

a substrate;

an organic optoelectronic device selected from an organic phototransistor, an organic photodetector, and an organic photovoltaic device disposed over said substrate;

a cover over said organic optoelectronic device, wherein said cover permits transmission of light between an outer environment and said organic optoelectronic device, and wherein said cover and said substrate cooperate to restrict transmission of oxygen and water vapor from said outer environment to said organic optoelectronic device; and

a patterned getter layer disposed between said substrate and said cover, said patterned getter layer being configured so as to substantially avoid obstructing said transmission of light between said outer environment to said organic optoelectronic device.

22. The organic optoelectronic device structure of claim 21, which is an organic phototransistor device structure.

23. The organic optoelectronic device structure of claim 21, which is an organic photodetector device structure.

24. The organic optoelectronic device structure of claim 21, which is an organic photovoltaic device structure.

25. The organic optoelectronic device structure of claim 21, wherein an array of said organic optoelectronic devices is provided, and wherein at least a portion of said patterned getter layer is provided between said organic optoelectronic devices within said array.

26. A flexible OLED device structure comprising:

- a flexible substrate;
- a flexible OLED display area comprising a plurality of active pixels disposed over said substrate, each of said plurality of active pixels comprising an anode region, a cathode region and a light-emitting region;
- a flexible cover over said OLED display area, wherein at least one of said flexible substrate and said flexible cover permits transmission of light from said plurality of active pixels to an outer environment, and wherein said flexible cover and said flexible substrate cooperate to restrict transmission of oxygen and water vapor from said outer environment to said OLED display area; and
- a patterned getter layer disposed between said flexible substrate and said flexible cover, wherein at least a portion of said patterned getter layer is provided over non-emitting regions of said OLED display area between at least some of said plurality of pixels.

27. The flexible OLED device structure of claim 26, wherein at least one of said flexible substrate and said flexible cover comprises a composite barrier region, said composite barrier region further comprising two or more planarizing layers and two or more high-density layers.

28. The flexible OLED device structure of claim 26, wherein said patterned

getter layer comprises at least one material selected from Group IIA metals and Group IIA metal oxides.

29. The flexible OLED device structure of claim 26, wherein portions of said patterned getter layer are sufficiently narrow to prevent said patterned getter layer from cracking when said OLED device structure is flexed during normal service.

30. The flexible OLED device structure of claim 29, wherein said patterned getter layer comprises a plurality of narrow bands of getter material.

31. The flexible OLED device structure of claim 29, wherein said patterned getter layer comprises a plurality of small dots of getter material.

32. The flexible OLED device structure of claim 26, wherein a portion of said patterned getter layer is provided adjacent to each of said plurality of pixels.